Two African species pairs

by P. L. Britton

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Benson, Irwin & White (1959) discussed species pairs in the Rhodesias and Nyasaland (now Malawi, Rhodesia and Zambia). Only two of the many pairs mentioned there will be discussed in this paper.

Merops pusillus and *M. variegatus*. These two very similar species are sympatric in Angola, northern and western Zambia, and the southern Congo (Mackworth-Praed & Grant, 1962). Where sympatric, they differ ecologically in that *variegatus* is confined to wetter and more open country, in which *pusillus* is less frequent or absent (Benson, Irwin & White, 1959; Traylor, 1963).

It is worth mentioning the more detailed data now available for western Zambia. Benson (1962) could give no record of *variegatus* from the Barotse Province, but subsequently Benson (1964) has collected it north-east of Mongu (where common), and on the Matabele Plain, and Traylor (1965) has collected it at Lake Sihole. There is no definite record from the apparently very suitable Barotse Plain where Benson (1962) did, however, collect *pusillus* in typical *variegatus* habitat. *Pusillus* is widespread in the Barotse Province in its more normal habitat of bushes and rank grass, generally near water (Benson & White, 1957), as well as apparently occupying the Barotse Plain. My own experience is that the two species are ecologically segregated in the adjacent Balovale District of the North-Western Province. *Variegatus* is locally common in open permanently wet areas, without bushes or other cover, west of the Zambezi River and on the Zambezi flood-plain itself, but is otherwise probably absent. *Pusillus* is widespread and common in most wet areas where there is substantial cover, and locally so in a variety of dry wooded habitats. They occur within a few hundred yards of one another along both the Zambezi and South Kasiji Rivers.

It seems that *pusillus* and *variegatus* do not normally compete as they are segregated by habitat preference, but this does not appear to be the case on the Barotse Plain, where *pusillus* occupies habitat normally favoured by *variegatus*, yet *variegatus* occurs locally in similar habitat less than twenty miles away. In Rhodesia, where *variegatus* is absent, *pusillus* occupies all open or lightly wooded areas in the vicinity of water below 6,000 ft. (Smithers, Irwin & Paterson, 1957). Although *pusillus* and *variegatus* can most probably not co-exist, *variegatus* does appear in the field to be a larger, heavier bird. This apparent size difference was noted by Benson, Irwin & White (1959) who mentioned the need for verification by actual weighing, but they overlooked the data in Verheyen (1953). Weights and wing-lengths for both species are given in Table I.

The average weight of *variegatus* (21.3 gm.) is far larger than that of *pusillus* (14.1 gm.), whereas there is considerable overlap in wing-lengths. Most of the Rhodesia–Botswana *pusillus* are as large as, or larger than, the Upemba *variegatus*, but there is very little overlap in the wing-lengths of the two species at Upemba. This variation in the wing-length of *pusillus* will not be discussed here. The ratio, weight: wing-length was computed for all *variegatus* and for the 56 *pusillus* where individual wing-lengths

TABLE I

Weights and wing-lengths of the species pair, *Merops pusillus* and *M. variegatus*

MEROPS PUSILLUS			*MEROPS VARIEGATUS*		
sex	*weight (gm.)*	*wing (mm.)*	*sex*	*weight (gm.)*	*wing (mm.)*
(1) Upemba, southern Congo (Verheyen, 1953)			Upemba (Verheyen, 1953)		
12♀♀	11–17	71–80	♂	20	82
7 ♂♂	8–15	73–79	♂	20	79
(2) Northern Kenya (Irwin)			♂	21	83
2 ♂♂	14, 15	76, 79	♂	25	83
(3) Matengo Highlands, southern Tanzania (Meise, 1937)			♀	21	80
5 unsexed	14–19	77–80	♀	21	82
(4) Balovale, Zambia (Britton)			♀	21	84
8 unsexed	12.4–14.9	75–83			
(5) Botswana (Irwin)					
4 ♀♀	12–17	82–84			
♂	15	83			
(6) Rhodesia (Irwin and Jackson)					
14 ♀♀	12.5–17.1	80–89			
8 ♂♂	15–17.5	80–86			
2 unsexed	13, 13	85–86			

were available. The averages of these ratios are 0.18 (*pusillus*) and 0.26 (*variegatus*); the difference between them is statistically very significant ($P < 0.001$). A *t*-test was used.

The weight difference, and more especially the weight: wing-length difference, between these two species indicates a sufficient size difference to enable them to co-exist, though the evidence available suggests that they do not.

Tchagra senegala and *T. australis*. These two similarly coloured species are sympatric through much of southern and eastern Africa (Mackworth-Praed & Grant, 1963). Benson, Irwin & White (1959) suggested that although they overlap widely they probably do not compete, as *senegala* is an altogether larger bird and they probably take different food. Brooke (1965) found them ecologically segregated in the Kafue National Park, Zambia with *senegala* largely if not entirely confined to *Brachystegia* woodland, irrespective of the height of the underlying grass, and *australis* largely if not entirely confined to thickets, and when in *Brachystegia*, only where there was a semi-thicket of underbrush. His remarks for *australis* were specifically restricted to *T. a. minor*. I did not find any obvious ecological segregation in the Balovale District where *australis* are intermediate between *T. a. souzae* and *T. a. rhodesiensis* (Benson & Irwin, 1967), but my records for *australis* are few. I found *senegala* widespread in all woodland with long grass, and one of the three nests which I found was in very thick regenerating *Cryptosepalum* scrub amongst *Burkea* woodland. My few records of *australis* are from slightly cleared *Brachystegia* and adjacent cassava lands, and I caught it twice in *Brachystegia* within a few yards of an occupied nest of *senegala*. White (1946) found *australis* much less common than *senegala* in the North-Western Province (which includes the Balovale District) and implied that *australis* prefers low growths of bushes whereas *senegala* is common in all woodland with long grass. The limited evidence available suggests that *senegala* and *australis* are ecologically segregated locally, but often co-exist. Weights and wing-lengths for both species are given in Table II.

TABLE II

Weights and wing-lengths of the species pair, *Tchagra senegala* and *T. australis*

TCHAGRA SENEGALA			*TCHAGRA AUSTRALIS*		
sex	*weight (gm.)*	*wing (mm.)*	*sex*	*weight (gm.)*	*wing (mm.)*
(1) Upemba (Verheyen, 1953)			(1) Matengo Highlands (Meise, 1937)		
5 ♀♀	46–62	88–90	2 ♀♀	34, 40	74, 75.5
8 ♂♂	49–63	88–91	(2) North-eastern Tanzania (Moreau, 1944)		
2 unsexed	55, 58	85, 88	♀	32.8	—
(2) Matengo Highlands (Meise, 1937)			(3) North-western Zambia (Britton and Payne)		
8 unsexed	46–54	82–87	♀	32.7	73
(3) Balovale (Britton)			4 unsexed	36.5–40.5	78.5–79
♂	54.5	89	(4) Botswana (Irwin)		
3 unsexed	61–64	88–91	2 ♀♀	29, 31	74, 75
(4) Botswana (Irwin)			6 ♂♂	30–35	74–80
♀	50	87	(5) Rhodesia (Irwin and Jackson)		
♂	52	89	7♀♀	29.5–34.6	73–79
(5) Rhodesia (Irwin and Jackson)			12 ♂♂	30–38	73–78
4 ♀♀	44–54	89–92	(6) Mozambique (Irwin)		
3 ♂♂	54–56	89–92	♂	34.4	71
1 unsexed	65	93			
(6) Mozambique (Irwin)					
♀	54.3	89			
♂	52	90			

The difference in the average weight of *senegala* (53.1 gm.) and *australis* (33.3 gm.) is considerable for two species whose size difference, as based on wing measurements, is small (see, for example, McLachlan & Liversidge, 1957). The ratio, weight: wing-length was computed for the 29 *senegala* and the 34 *australis* where individual wing-lengths were available. The averages of these ratios are 0.63 (*senegala*) and 0.44 (*australis*); the difference between them is statistically very significant ($P < 0.001$). A *t*-test was used.

A size difference between these two species is very apparent both in life and in the museum skin (Irwin, pers. comm.), and though this difference is poorly reflected by standard measurement data it is obviously considerable, and hardly surprising in two so broadly sympatric, yet ecologically similar, species.

SUMMARY

The two African species pairs, *Merops pusillus* and *M. variegatus*, and *Tchagra senegala* and *T. australis* are discussed. The mutual ecology of the first pair in western Zambia is discussed, and it seems likely that they cannot co-exist there. *Variegatus* is larger than *pusillus*, and the difference between their weight: wing-length ratios suggest that they should be able to do so. The limited evidence available on the mutual ecology of the second pair suggests that although they are ecologically segregated locally, they often co-exist in apparent competition. As *senegala* is considerably larger than *australis* they presumably take different food and do not in fact compete. The difference between their weight: wing-length ratios is statistically very significant.

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Seasonal movement and variation in the southern populations of the Dusky Lark *Pinarocorys nigricans* (Sundevall)

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The Dusky Lark *Pinarocorys nigricans* (Sundevall) of Ethiopian Africa is a polytypic species of two spatially remote races: *P.n. nigricans* (Sundevall), 1850: Aapies R., Pretoria, Transvaal, and *P.n. erythropygia* (Strickland), 1850: Kordofan, Sudan. The northern race, *P.n. erythropygia* differs from the southern one in having the rump and upper tail-coverts ochraceous-tawny, and the outer tail-feathers and the bases of the others dull tawny. While often treated as discrete species, it is convenient to consider them as well-marked races of but a single species. Both races appear to have a closely similar post-breeding movement pattern, *i.e.*, breeding in the dry season in heavily wooded savanna, then moving north or south as the case may be with the onset of the main rains into drier and more open habitats.

In the southern *P.n. nigricans*, the precise breeding range and nature of